

CLAIMS

We Claim:

- 5 1. A method for selecting an optimal coupling temperature of a nucleic acid synthesis reaction comprising:
- a) providing:
- i. a nucleic acid synthesizer comprising a heating component;
- and
- 10 ii. nucleic acid synthesis reagents;
- b) synthesizing a plurality of nucleic acid molecules with said synthesizer and said nucleic acid synthesis reagents, wherein the synthesis of each nucleic acid molecule of said plurality of nucleic acid molecules comprises a coupling reaction performed at a
- 15 different temperature within a temperature range; and
- c) measuring nucleic acid synthesis efficiency for each of said syntheses of said plurality of nucleic acid molecules; and
- d) selecting an optimal coupling temperature within said temperature range.
- 20 2. The method of Claim 1, wherein said temperature range is 20 to 60 degrees C.
3. A nucleic acid synthesizer comprising one or more reaction chambers and
- 25 a heating component configured to heat said one or more reaction chambers during a synthesis reaction.
4. The nucleic acid synthesizer of Claim 3, wherein said heating component comprises a resistance heater.

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5. The nucleic acid synthesizer of Claim 3, wherein said heating component comprises a Peltier device.

6. The nucleic acid synthesizer of Claim 3, wherein said heating component comprises a heated reagent.

7. The nucleic acid synthesizer of Claim 3, wherein said heating component comprises a magnetic induction device.

8. The nucleic acid synthesizer of Claim 3, wherein said heating component comprises microwaves.

9. The nucleic acid synthesizer of Claim 3, wherein said heating component comprises a transfer of heat from a fluid or a gas.

10. A nucleic acid synthesizer, comprising:

- a. one or more reaction chambers containing an oligonucleotide; and
- b. a heating component,

wherein said heating component is configured to heat said one or more reaction chambers during a synthesis reaction wherein said oligonucleotide is coupled to a synthesis reagent.